

इंटरनेट

मानक

### Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11132 (1985): Ammonia Valves [MED 17: Chemical Engineering Plants and Related Equipment]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE





Indian Standard

## SPECIFICATION FOR AMMONIA VALVES

**1. Scope** — Specifies requirements for high duty cast iron and alloy cast iron valves for refrigeration plants. It covers the valves of high and normal pressure with screwed ends as well as with the flanged ends of typical shape and design corresponding to the size of the valves.

**1.1** The valves shall be of rising stem with handwheel.

**1.2** This standard covers the nominal sizes of 6, 10, 15, 20, 25, 32, 40, 50, 65, 75 and 100 mm.

**Note** — The sizes 32 and 65 mm are non-preferred sizes.

**2. Dimensions** — The dimensions and tolerances of various types of ammonia valves shall be as given in Tables 1 to 11.

### 3. Design

**3.1 Pressure/Temperature Rating** — The pressure/temperature ratings for the valves covered by this standard are in accordance with 'Indian standard specification for steel pipe flanges and flanged fittings (*under preparation*)' for respective body materials.

**3.1.1** Pressure/temperature ratings may be interpolated between the pressure/temperature tabulated for intermediate service conditions.

**3.2 Body and Bonnet** — The design of the body and bonnet shall be such as will provide ample resistance to distortion under all reasonable conditions that may be encountered in service and avoid any undue strain or distortion of any working parts and thereby impair the working of the valve.

**3.2.1** The body shall be designed as to offer least possible resistance to free flow of liquid/gas through the valve. The counter of the body and bonnet and of all flow passages through the same and through the partition valve will be circular or elliptical and shall have sufficient radii to minimize stress, turbulence, erosive effects and restriction to flow.

**3.2.2** The body and bonnet of valve sizes 6 to 25 mm shall have male and female threads and for sizes 32 to 100 mm the body and bonnet shall be flanged type having male and female seats and shall have a minimum of four stud bolts. The minimum size of bolts shall be as follows:

From 32 mm to 50 mm — M12

From 65 mm to 100 mm — M16

However, the design of the bolting shall be such that the total cross sectional area of the bolts shall be sufficient to produce a stress not exceeding 600 kgf/cm<sup>2</sup> at the root of threads by a pressure equal to the nominal pressure rating acting in an area bounded by the effective outside periphery of the gasket (for a ring joint, use pitch circle diameter). The bolting shall be supplied in parkerized, phosphated or in any other rust-protected surface condition.

**3.2.3** The body and bonnet joints shall be spot faced or back faced and shall be machine finished on the joint side.

**3.2.4** The bonnet shall be screwed type up to 25 mm size and for size above 25 mm it shall be of bolted type.

**3.2.5** The wall thickness of the bonnet shall confirm with the pressure/temperature rating of the valve but shall not be less than 8 mm in any case.

Adopted 29 January 1985

© May 1985, ISI

Gr 7

## IS : 11132 - 1985

**3.2.6** The face-to-face and end-to-end dimensions of the valves shall be as given in the Tables 1 to 11.

**3.2.7** The valve body shall be provided with seat cast in the body itself being the integral part.

**3.2.8** The seat bore shall not be less than the flow area of the end flange port.

**3.3 End Connection** — Threaded end valves shall be internal threaded complying with the requirements of IS : 554-1975 'Dimensions for pipe threads where pressure tight joints are required on the threads (*second revision*)', either taper or parallel at manufacturer's option unless the very form is specified in the purchase order.

**3.4 End Faces** — The end faces of the parallel threaded valves shall be provided with a smooth finish and nut shape casted alongwith the body. The flanged end valves shall have male seat on one side and female seat on the other side, with bolt holes at the corner. The flange shall be either square or elliptical in shape and casted alongwith the body.

**3.5 Joints** — Being a flange of typical shape and of square or elliptical section and having a groove at the end, it shall be bolted to pipe with similar flange and a lead or asbestos packing in between to make it a gas tight connection, whereas the screwed end valves shall be connected with normal screwing and unscrewing in all the pipe lines.

**3.6 Stem and Stemnut** — The stem shall be of one piece for sizes 6 to 25 mm and for sizes above 25 mm the seat at the bottom of the stem shall be fixed separately with the help of check nut. This seat shall be white metal coated and shall be of sufficient strength.

**3.6.1** The material of the stem for all sizes shall be of grade 15C8 of IS : 1570 (Part 2)-1979 'Specification for carbon steels (unalloyed steels) (*first revision*)'. The material of the seat for sizes 32 to 100 mm shall be 15C8 steel or cast iron coated with white metal on the front portion of the seat nut. For sizes 6 to 25 mm, the seat shall be 15C8 steel.

**3.6.2** The stem shall be operated by rotating it in the stem nut-mounted at the top of the body. The stem nut shall have square shank, round shank with keyway or other suitable means for attaching the handwheel. Stem nut arrangement shall be suitably designed to permit removal of handwheel without allowing the stem and disc to drop into closed position, when the handwheel is removed with the valve in open position.

**3.6.3** All contact surfaces between the stemnut and yoke shall be machine finished and stem nut properly secured to prevent loosening in service.

**3.6.4** The threads of the stem and stemnut shall be of ACME type or stub ACME type. Alternatively, the threads may be of trapezoidal type in accordance with IS : 7008 'Specification for ISO metric trapezoidal screw threads' (issued in 4 parts).

**3.6.5** The size of the stem for each size and class of valves shall be as follows :

Size of valve, mm	6	10	15	20	25	32	40	50	60	75	100
Dimension of stem, mm	8	8	11	11	15	15	19	19	19	23	23

**3.6.6** The stem shall be ground finished to prevent damage to packing during operation.

**3.7 Gland and Gland Nut** — The gland shall be of minimum two pieces self-aligning design consisting of a gland bush and gland washer.

**3.7.1** The gland bush shall have a shoulder at its outer end to prevent complete entry of the gland bush into stuffing box.

**3.7.2** The gland nut shall be provided with female threads.

**3.8 Stuffing Box and Packing** — The design of stuffing box shall be of sufficient strength such as to prevent any deformation or distortion during service.

3.8.1 The stuffing box diameter and packing width shall be as follows :

Valve Size	Stuffing Box Diameter	Packing Width
mm	mm	mm
6	12.7	6
10	12.7	6
15	26.2	6
20	26.2	6
25	26.2	6
32	29.4	6
40	30.2	6
50	32.5	6
65	32.5	6
75	32.5	6
100	35.5	6

3.8.2 The minimum depth of stuffing box shall be as under :

Valve size, mm	6	10	15	20	25	32	40	50	65	75	100
Depth, mm	16	16	22	22	25	25	25	25	25	27	27

3.8.3 The inside of the stuffing box shall be reamed smoothly to prevent any damage to packing during compression.

3.8.4 The packings shall be square or rectangular in cross section. The stuffing box shall be filled with packing completely prior to compression by gland. Moulded packings in lieu of braided packings may also be used.

3.9 *Handwheel and Nut* — The handwheel of the valve shall be of spoke and rim design having not more than six spokes.

3.9.1 The handwheel shall be fixed to the stem by handwheel nut.

3.9.2 *Operation* — Valve shall be designed to operate directly from the handwheel. Handwheel shall be marked 'open' with an arrow indication in accordance with IS : 9866-1981 'Marking system for valves.'

3.9.3 The handwheel shall be of grey iron casting. The material of the nut shall be 15C8 of IS : 1570 (Part 2)-1979.

4. **Material** — The material used for ammonia valves shall remain impervious to ammonia gas (refrigerent) in the system. The material to be used for various parts of the ammonia valves shall be as follows :

Sl No.	Item	Material
a)	Body	Cast iron casting as per IS : 210-1978 'Grey iron castings (third revision)
b)	Body seat	Cast iron casting as per IS : 210
c)	Seat nut	15C8 of IS : 1570 (Part 2)-1979 and white metal coated on front seat
d)	Bonnet	Up to 25 mm size valves, 15C8 of IS : 1570 (Part 2)-1979 and for size 32 to 100 mm, cast iron castings
e)	Gland nut	For sizes 6 to 20 mm, 15C8 of IS : 1570 (Part 2)-1979 and for size 25 to 100 mm, cast iron coating
f)	Gland bush	15C8 of IS : 1570 (Part 2)-1979
g)	Spindle	15C8 of IS : 1570 (Part 2)-1979
h)	Handwheel	Cast iron casting
j)	Washer	Mild steel
k)	Nut	15C8 of IS : 1570 (Part 2)-1979
m)	Gasket	Between body and bonnet — lead or asbestos

## IS : 11132 - 1985

**4.1** The material of the gasket shall be suitable for the service conditions and for the pressure/temperature rating of the valve.

**4.2** Any material other than those specified in 4 if required shall be stated in the purchase order and may be supplied subject to agreement between the purchaser and the manufacturer. The material shall confirm to the relevant specifications in all respects.

### 5. Inspection and Test

**5.1 Inspection** — If inspection by purchaser is specified in the purchase order, it shall be as specified in IS : 6157-1981 'Valve inspection and test (*first revision*)'. If this inspection is not specified, the valve shall meet the requirements of visual examination described in IS : 6157-1981.

**5.2 Pressure Test** — All valves shall be subjected to pressure test in the soap bath solution at 2 MPa by compressed air. The slightest of bubbles showing on the body or on the seat shall be the cause for rejection. The duration of the pressure test shall be 30 seconds. There shall be separate pressure test for body and seat.

**6. Marking** — The valves shall be marked as specified in IS : 9866-1981 'Marking systems for valves'.

**6.1 ISI Certification Marking** — Details available with the Indian Standards Institution.

### 7. Shipment/Despatch

**7.1** The valves shall be shipped in closed position, glands fully packed and all opening properly closed.

**7.2** All machined and threaded parts shall be suitably protected with an approved rust preventive.

**7.3** Valves shall be shipped with handwheel removed to protect against damage during shipment. The handwheels shall be packed in a separate box, if the number of valves is 10 or more. For less than 10 valves, the handwheels may be attached to the valves by wire or other suitable means.

**7.4** The valves shall be shipped in wooden crates individually or collectively in a manner to prevent shifting within the package.

**7.5** Shipping of loose valves is not recommended and if done it will be at the risk of the manufacturer who will replace the same if any valves are damaged during transit.

**8. Guarantee** — The manufacturer shall, by acceptance of the purchase order guarantee the material, the design and the operation of the valves covered by the order to the extent, that if any defect attributable to faulty workmanship, design or material are faced in the valves within a period of one year after they are placed in regular service or 18 months (whichever is less) from the date of receipt of the valves, the manufacturer will furnish free of charge at the original point of delivery, any part or parts thereof that prove defective, provided the valves have not been misused or abused and have been installed in service for which they were recommended. If any valve is found to be defective prior to placement in service the same shall be replaced by the manufacturer free of cost.

## EXPLANATORY NOTE

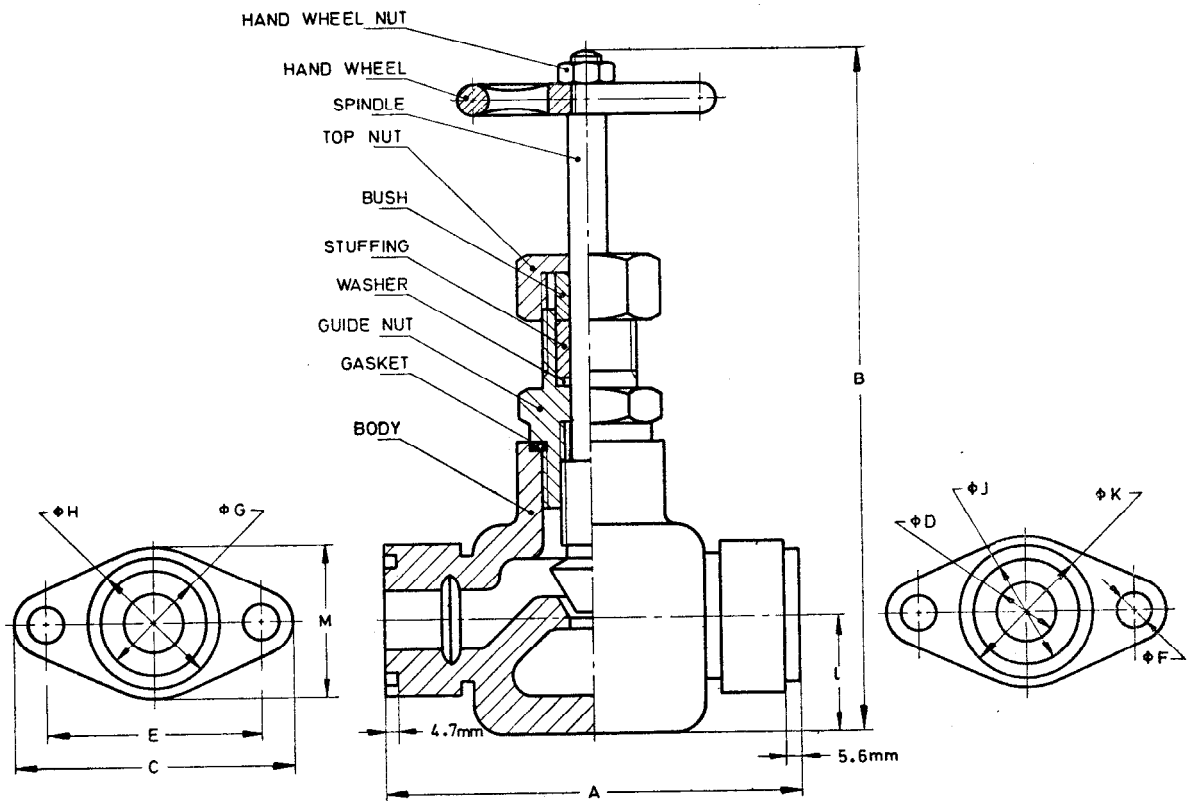
Ammonia valves are widely used in Ice Factories, Breweries, Cold Storage Plants and Refrigeration Works. The dimensions and materials selection for Ammonia Valves given in this Standard are based on the practices being followed by the industries in India.

In addition to the need for conformity to IS : 6157-1981, pressure test for ammonia valves has been included in the standard to have a better assessment of the product to ensure leakage resistance.

**TABLE 1 DIMENSIONS AND TOLERANCES FOR FLANGED GLOBE VALVE  
SIZES 15 TO 25 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size		Tolerances	15	20	25
Length	A	$\pm 3.0$	150.0	175.0	170.0
Height	B	$\pm 8.0$	180.0	185.0	210.0
Width	C	$\pm 1.2$	108.0	105.0	117.0
Dia of bore	D	$\pm 3.0$	12.0	19.0	25.0
Centre-to-centre distance for fixing hole	E	$\pm 0.4$	76.0	76.0	82.5
Hole dia for bolt	F*	+0.18	13	17	17
OD of female seat	G	+0.15	44.3	45.2	53.1
ID of female seat	H	-0.15	32.1	34.4	40.9
OD of male seat	J	-0.15	44.1	45.0	52.9
ID of male seat	K	+0.15	32.4	34.7	41.1
Centre line distance from bottom	L	$\pm 2.0$	30.0	45.0	38.0
Width of flange	M	$\pm 1.2$	57.0	58.0	64.0

**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

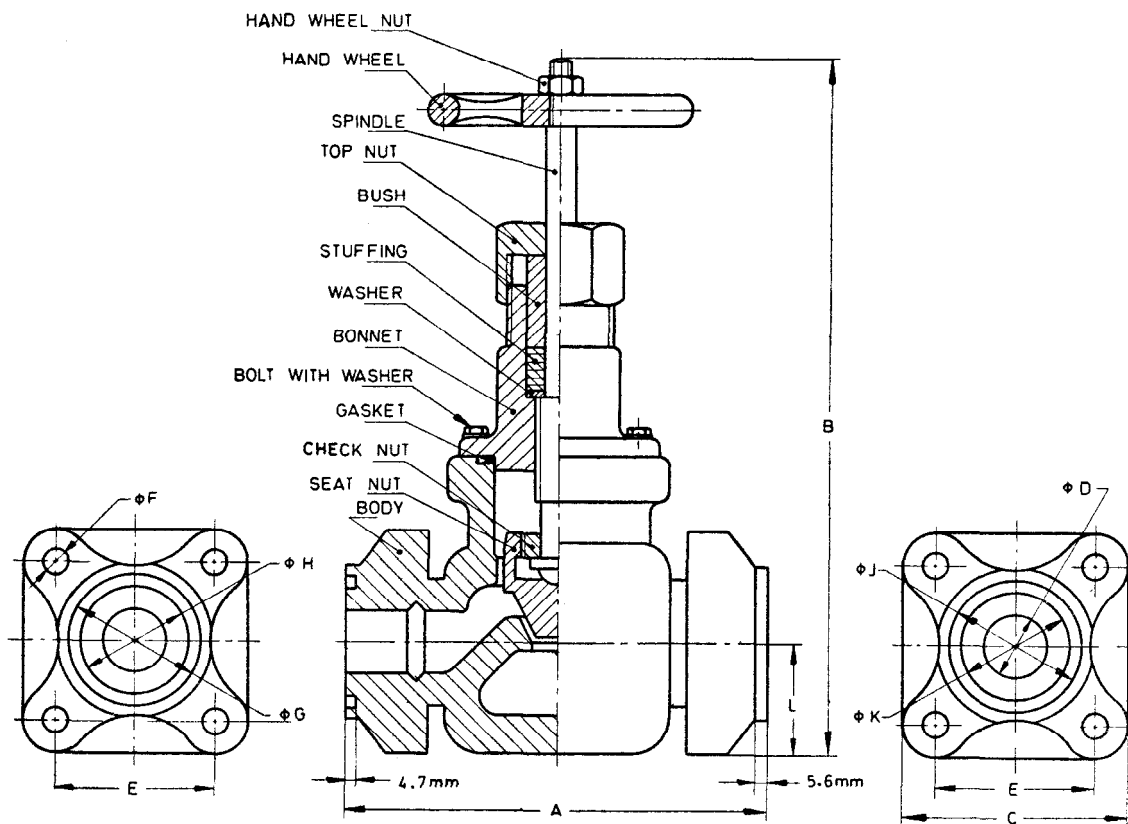
**Note 2** — Working pressure 1.8 MPa.

\*Fine series according to IS : 1821-1982 'Clearance holes for bolts and screws ( second revision )'.



**TABLE 2 DIMENSIONS AND TOLERANCES FOR FLANGED GLOBE VALVE  
SIZES 32 TO 100 mm  
( Clause 2 )**

All dimensions in millimetres.



Valve Size	Tolerances	32	40	50	65	75	100	
Length	A	±3·0	230·0	235·0	254·0	310·0	340·0	380·0
Height	B	±8·0	320·0	340·0	380·0	420·0	465·0	570·0
Width	C	±1·2	100·0	108·0	120·0	152·0	160·0	177·0
Dia of bore	D	±1·0	30·0	38·0	51·0	64·0	76·0	102·0
Centre to centre distance for fixing hole	E	±0·4	61·0	68·0	79·5	101·5	105·5	125·0
hole dia for bolt	F*	+0·18	17	17	17	19	19	19
OD of female seat	G	+0·15	58·8	70·5	83·6	96·5	112·3	137·8
ID of female seat	H	-0·15	48·0	56·5	63·1	75·6	93·0	116·5
OD of male seat	J	-0·15	58·6	70·2	83·3	96·3	112·0	137·5
ID of male seat	K	+0·15	48·3	56·8	63·4	75·8	93·2	116·7
Centre line distance from bottom	L	±2·0	50·0	56·0	60·0	76·0	80·0	90·0

Note 1 — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

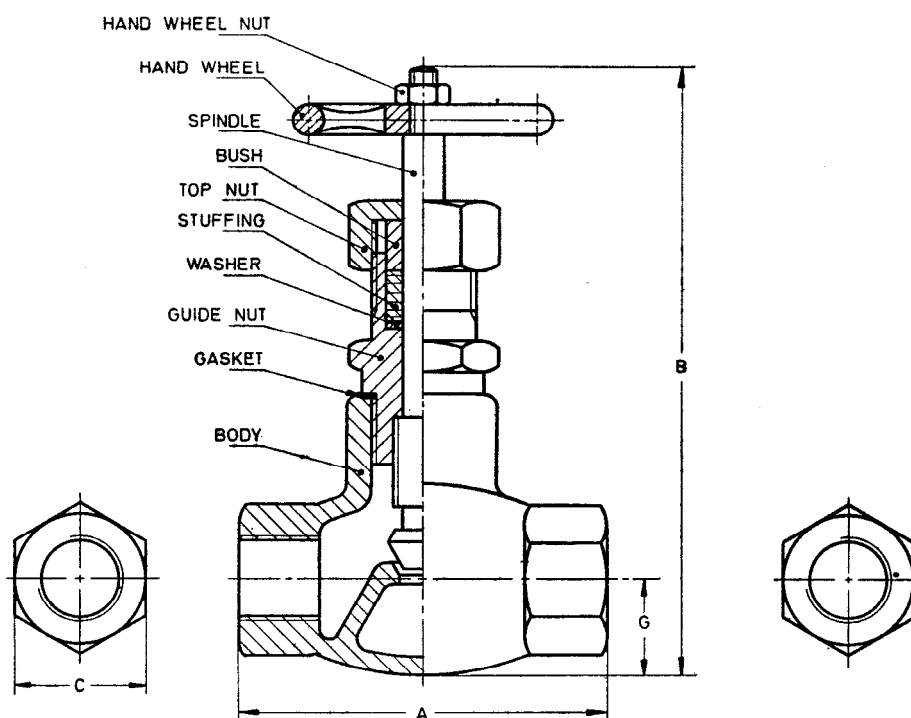
Note 2 — Working pressure 1·8 MPa.

\*Fine series according to IS : 1821-1982.

**TABLE 3 DIMENSIONS AND TOLERANCES FOR SCREWED GLOBE VALVE  
SIZES 6 TO 25 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size	Tolerances	6	10	15	20	25
Length <i>A</i>	$\pm 3.0$	75.0	75.0	80.0	125.0	135.0
Height <i>B</i>	$\pm 8.0$	150.0	150.0	165.0	200.0	220.0
Width <i>C</i>	$\pm 1.2$	30.0	31.0	38.0	45.0	54.0
Centre line distance from bottom <i>G</i>	$\pm 2.0$	21.0	24.0	40.0	33.0	33.5

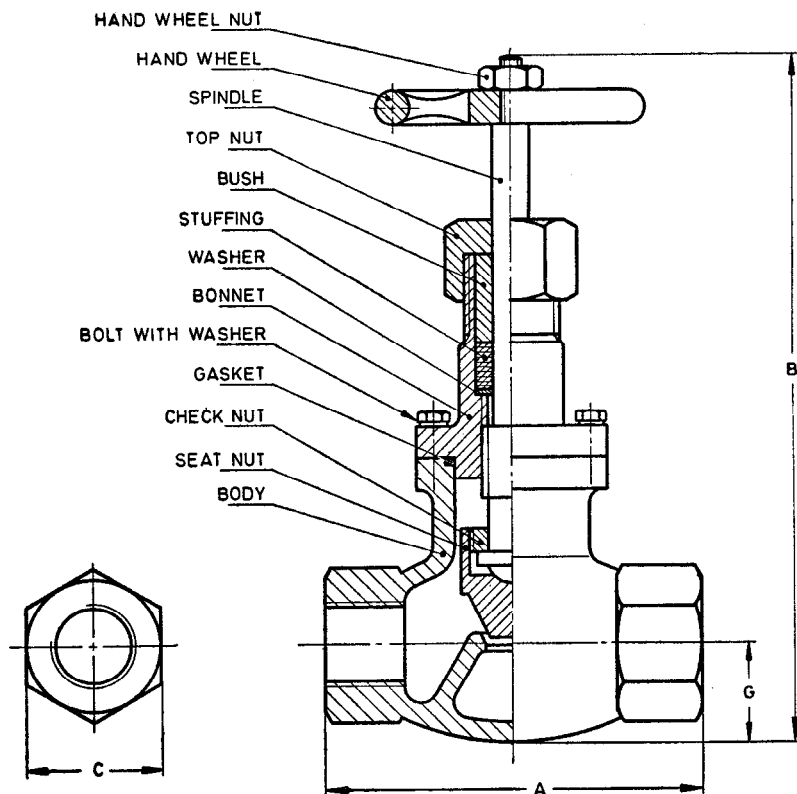
**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

**Note 2** — Working pressure 1.8 MPa.

**TABLE 4 DIMENSIONS AND TOLERANCES FOR SCREWED GLOBE VALVE  
SIZES 32 TO 50 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size		Tolerances	32	40	50
Length	A	$\pm 3.0$	177.0	210.0	205.0
Height	B	$\pm 8.0$	310.0	380.0	385.0
Width	C	$\pm 1.2$	73.0	80.0	86.0
Centre line distance from bottom	G	$\pm 2.0$	45.0	50.0	47.0

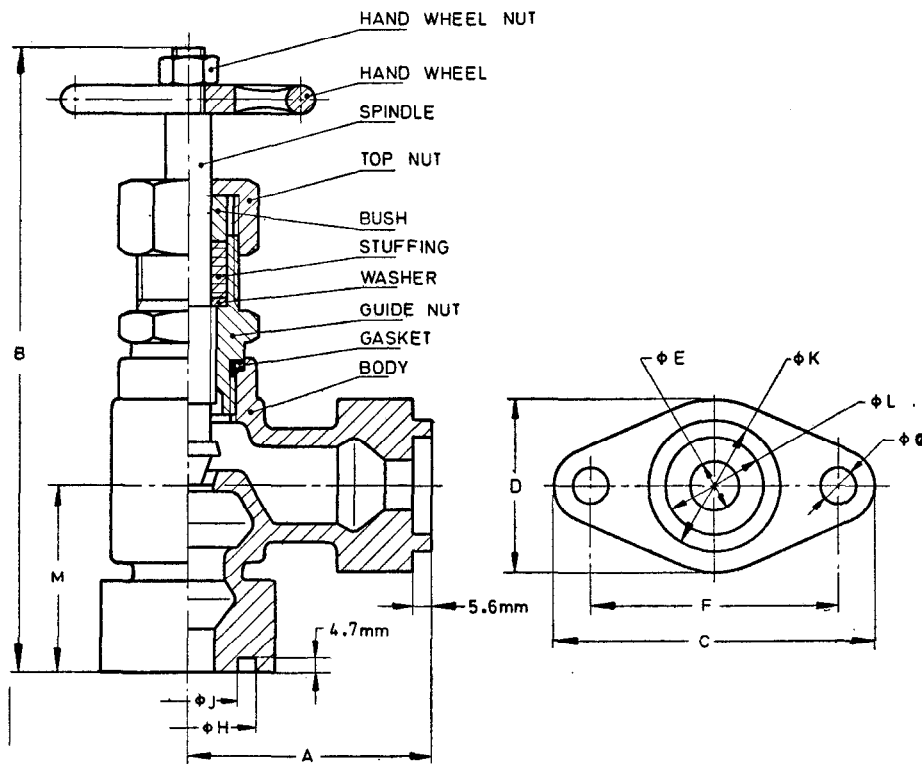
**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

**Note 2** — Working pressure 1.8 MPa.

**TABLE 5 DIMENSIONS AND TOLERANCES FOR FLANGED ANGLE VALVE (OVAL TYPE)  
SIZES 15 TO 25 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size		Tolerances	15	20	25
Centre line distance horizontal	A	$\pm 2.0$	80.0	85.0	76.0
Height	B	$\pm 8.0$	215.0	230.0	285.0
Width	C	$\pm 1.2$	108.0	105.0	117.0
Flange width	D	$\pm 1.0$	67.0	58.0	64.0
Dia of bore	E	$\pm 0.4$	12.0	19.0	25.0
Centre to centre distance for fixing hole	F	$\pm 0.4$	76.0	76.0	82.5
Hole dia for bolt	G*	+0.18	13	13	17
OD of female seat	H	+0.15	44.3	45.2	53.1
ID of female seat	J	-0.15	32.1	34.4	40.9
OD of male seat	K	-0.15	44.1	45.0	52.9
ID of male seat	L	+0.15	32.4	34.7	41.2
Centre line distance vertical	M	$\pm 2.0$	81.0	87.0	78.0

**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

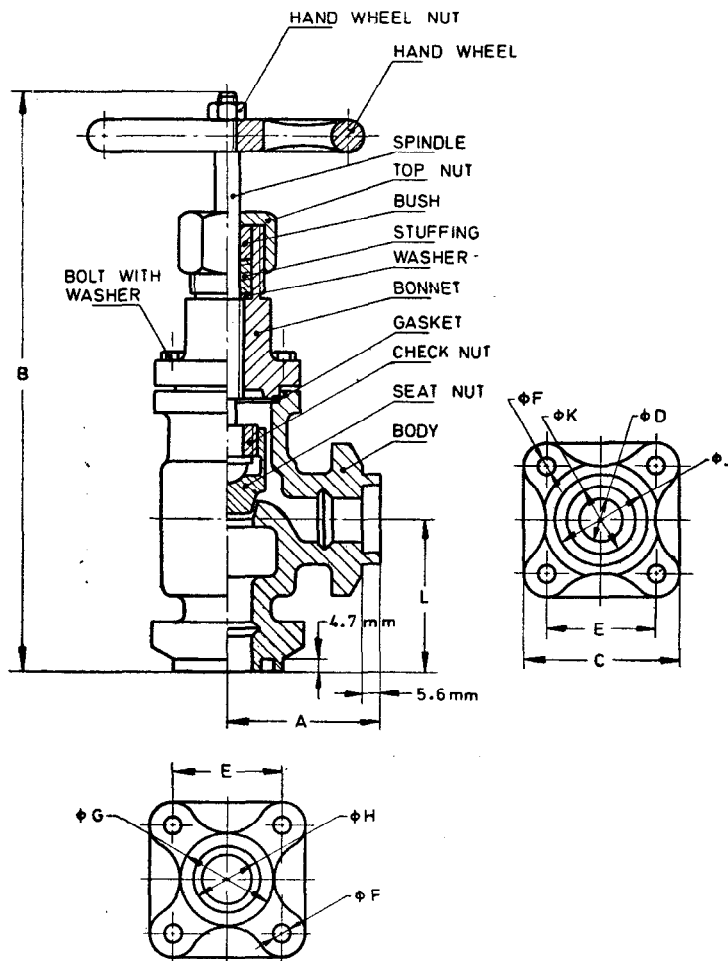
**Note 2** — Working pressure 1.8 MPa.

\*Fine series according to IS : 1821-1982.

**TABLE 6 DIMENSIONS AND TOLERANCES FOR FLANGED ANGLE VALVE  
SIZES 32 TO 100 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size		Tolerances	32	40	50	65	75	100
Centre line distance horizontal	A	±2·0	105·0	108·0	117·0	147·0	150·0	190·0
Height	B	±8·0	355·0	410·0	430·0	485·0	560·0	638·0
Width	C	±1·2	100·0	108·0	120·0	152·0	160·0	177·0
Dial of bore	D	±0·4	30·0	38·0	51·0	64·0	76·0	102·0
Centre to centre distance for fixing hole	E	±0·4	61·0	68·0	79·5	101·5	105·5	125·0
Hole dia for Bolt	F*	+0·18	17	17	17	19	19	19
OD of female seat	G	+0·15	58·8	70·5	83·6	96·5	112·3	137·8
ID of female seat	H	-0·15	48·0	56·5	63·1	75·6	93·0	116·5
OD of male seat	J	-0·15	58·6	70·2	83·3	96·3	112·0	137·5
ID of male seat	K	+0·15	48·3	56·8	63·4	75·8	93·2	116·7
Centre line distance vertical	L	±2·0	101·0	107·0	110·0	144·0	146·0	185·0

**Note 1** — The valve shall withstand pneumatic pressure of 2MPa while testing body and seat.

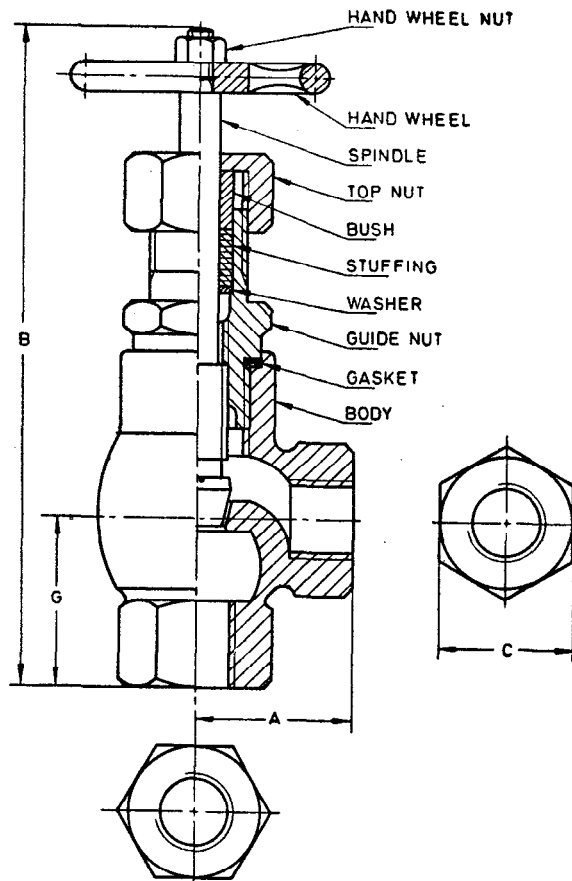
**Note 2** — Working pressure 1·8 MPa.

\*Fine series according to IS : 1821-1982.

**TABLE 7 DIMENSIONS AND TOLERANCES FOR SCREWED ANGLE VALVE  
SIZES 6 TO 25 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size	Tolerances	6	10	15	20	25
Centre line distance horizontal A	$\pm 2.0$	35.0	35.0	43.0	51.0	61.0
Height B	$\pm 8.0$	150.0	150.0	170.0	210.0	250.0
Width C	$\pm 1.2$	28.0	31.0	38.0	45.0	54.0
Centre line distance vertical G	$\pm 2.0$	37.0	37.0	45.0	56.0	62.0

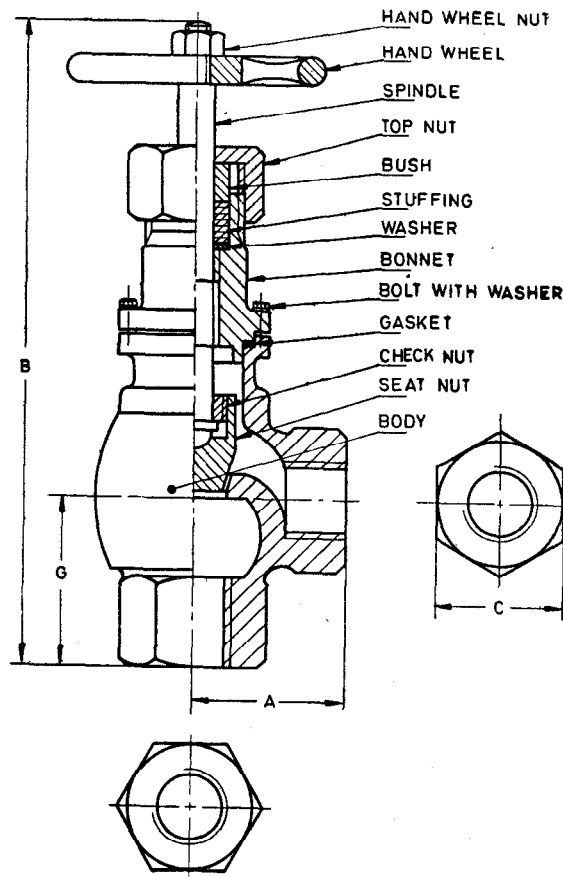
**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

**Note 2** — Working pressure 1.8 MPa.

**TABLE 8 DIMENSIONS AND TOLERANCES FOR SCREWED ANGLE VALVE  
SIZES 32 TO 50 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size	Tolerances	32	40	50
Centre line distance horizontal <i>A</i>	$\pm 2.0$	85.0	93.0	105.0
Height <i>B</i>	$\pm 8.0$	350.0	380.0	420.0
Width <i>C</i>	$\pm 1.2$	73.0	80.0	86.0
Centre line distance vertical <i>G</i>	$\pm 2.0$	86.0	95.0	109.0

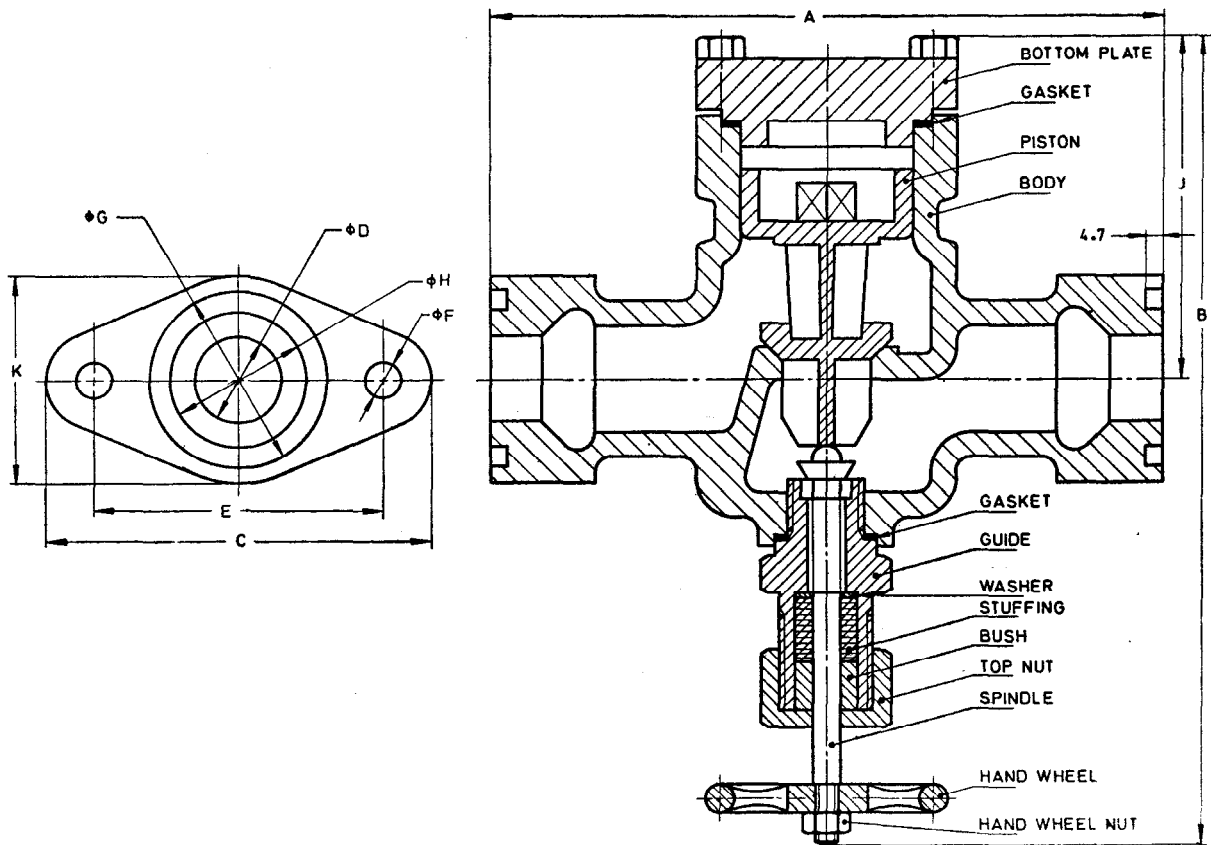
**Note 1** — The valve shall withstand pneumatic pressure of 2MPa while testing body and seat.

**Note 2** — Working pressure 1.8 MPa.

**TABLE 9 DIMENSIONS AND TOLERANCES FOR FLANGED CHECK VALVE  
SIZES UP TO 25 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size		Tolerances	20	25
Length	A	$\pm 3.0$	175.0	181.0
Height	B	$\pm 8.0$	185.0	191.0
Width	C	$\pm 1.2$	105.0	117.0
Dia of bore	D	$\pm 0.4$	19.0	25.0
Centre to centre distance for fixing hole	E	$\pm 0.4$	76.0	82.5
hole dia for bolt	F*	+0.18	17	17
OD of female seat	G	+0.15	45.2	53.1
ID of female seat	H	-0.15	34.4	40.9
Centre line distance from bottom	J	$\pm 2.0$	80.0	85.0
Width of flange	K	$\pm 1.2$	58.0	64.0

**Note 1** — The valve shall withstand pneumatic pressure of 2MPa while testing body and seat.

**Note 2** — Working pressure 1.8 MPa.

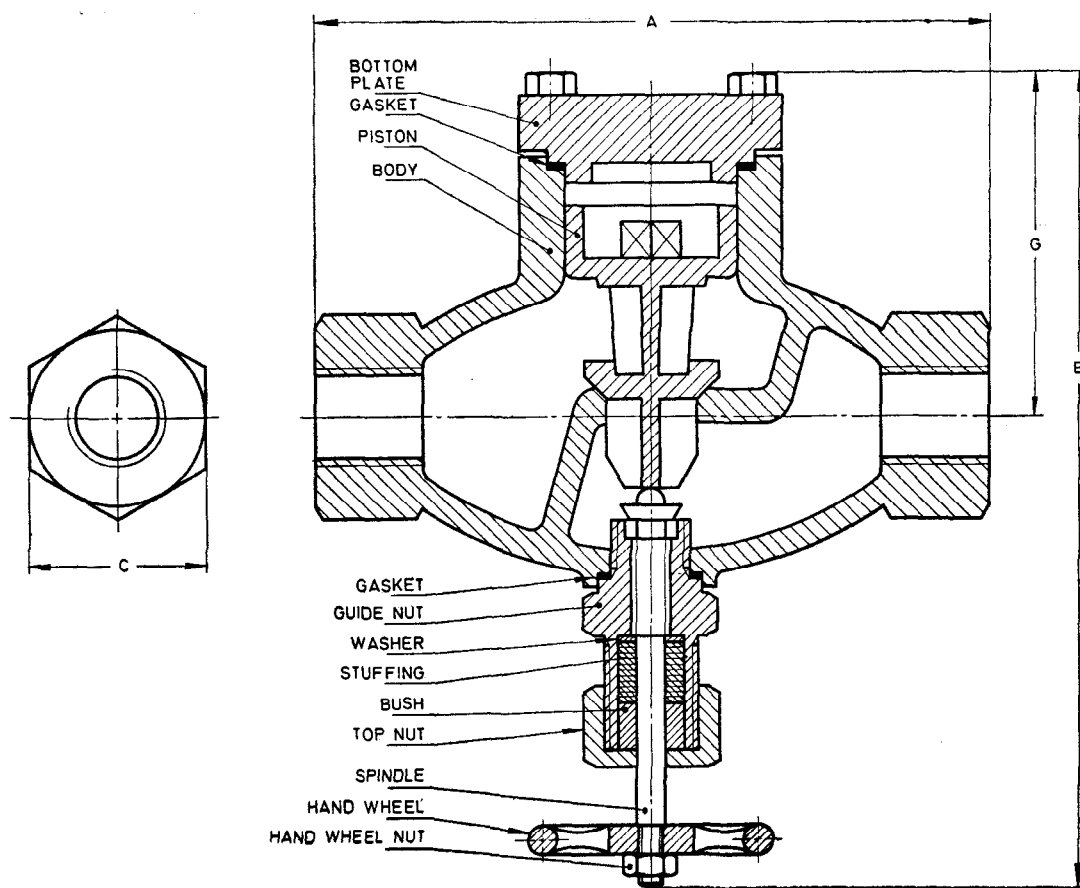
\*Fine series according to IS : 1821-1982.



**TABLE 10 DIMENSIONS AND TOLERANCES FOR FLANGED CHECK VALVE  
SIZES 32 TO 75 mm**

( Clause 2 )

All dimensions in millimetres.



Valve Size		Tolerances	32	40	50	65	75
Length	A	$\pm 3.0$	230.0	235.0	254.0	310.0	340.0
Height	B	$\pm 8.0$	260.0	280.0	290.0	315.0	355.0
Width	C	$\pm 1.2$	100.0	108.0	120.0	152.0	160.0
Dia of bore	D	$\pm 0.4$	30.0	38.0	51.0	64.0	76.0
Centre to centre distance for fixing holes	E	$\pm 0.4$	61.0	68.0	79.5	101.5	105.5
Hole dia for bolt	F*	+0.18	17	17	17	19	19
OD of female seat	G	+0.15	58.8	70.5	83.6	96.5	112.3
ID of female seat	H	-0.15	48.0	56.5	63.1	75.6	93.0
Centre line distance from bottom	J	$\pm 2.0$	116.0	119.0	127.0	147.0	165.0

**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

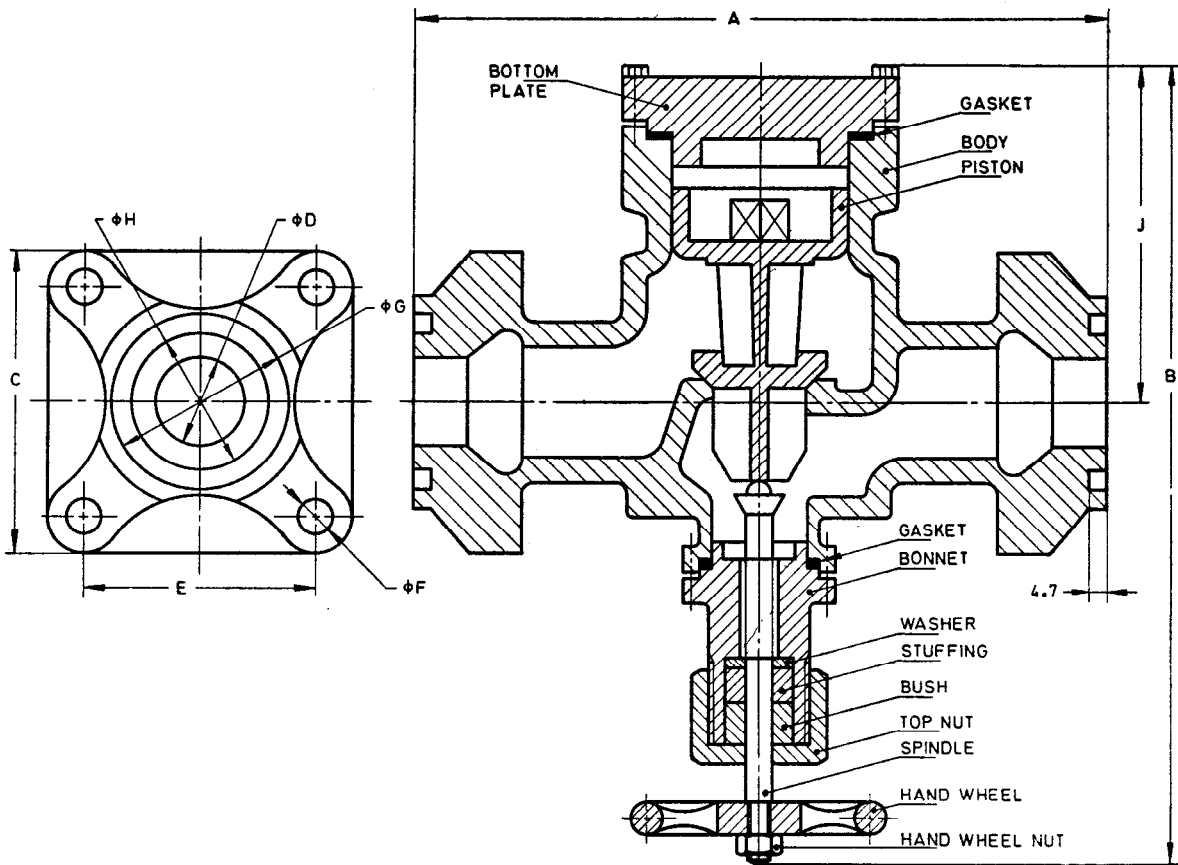
**Note 2** — Working pressure 1.8 MPa.

\*Fine series according to IS : 1821-1982.

**TABLE 11 DIMENSIONS AND TOLERANCES FOR SCREWED CHECK VALVE SIZES 20 TO 25 mm**

( Clause 2 )

All dimensions in millimetres



Valve Size		Tolerances	20	25
Length	A	$\pm 3.0$	85.0	127.0
Height	B	$\pm 8.0$	200.0	205.0
Width	C	$\pm 2.0$	45.0	54.0
Centre line distance from bottom	G	$\pm 2.0$	76.0	83.0

**Note 1** — The valve shall withstand pneumatic pressure of 2 MPa while testing body and seat.

**Note 2** — Working pressure 1.8 MPa.